UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF POLLUTION PREVENTION AND TOXICS

REGULATION OF A NEW CHEMICAL SUBSTANCE

PENDING DEVELOPMENT OF INFORMATION

In the matter of:	)	Premanufacture Notice Number:
	)	
	)	
	)	
	)	
	)	
Honeywell Chemicals	)	P-10-0455
	)	P-10-0457
	)	P-10-0489
	)	
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	)	

Consent Order and Determinations Supporting Consent Order

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PREAMBLE

I. INTRODUCTION

Under the authority of § 5(e) of the Toxic Substances Control Act ("TSCA") (15 U.S.C. 2604(e)), the Environmental Protection Agency ("EPA" or "the Agency") issues the attached Order, regarding premanufacture notices ("PMNs") P-10-0455, P-10-0489, and P-10-0457 for the chemical substances Propane, 1,1,1,2,3,3-hexafluoro- (CAS RN 431-63-0), 1-Propene, 1,2,3,3,3-pentafluoro- (CAS RN 2252-83-7), and Propane, 1,1,1,2,3-pentafluoro- (CAS RN 431-31-2) (in this Consent Order, these substances may individually or collectively be referred to as the "PMN substance(s)"), respectively, submitted by Honeywell Chemicals ("the Company"), to take effect upon expiration of the PMN review period. The Company submitted the PMNs to EPA pursuant to § 5(a)(1) of TSCA and 40 CFR Part 720.

Under § 15 of TSCA, it is unlawful for any person to fail or refuse to comply with any provision of § 5 or any order issued under § 5. Violators may be subject to various penalties and to both criminal and civil liability pursuant to § 16, and to specific enforcement and seizure pursuant to § 17. In addition, chemical substances subject to an Order issued under § 5 of TSCA, such as this one, are subject to the § 12(b) export notice requirement.

II. SUMMARY OF TERMS OF THE ORDER

The Consent Order for these PMN substance(s) requires the Company to:

- provide its workers respirators to prevent inhalation exposure;
- as an alternative to using respirators, maintain workplace airborne concentrations of the PMN substance(s) at or below a specified 8-hour time weighted average New Chemical Exposure Limit ("NCEL") of 3 parts per million ("ppm") and 15-minute Short-Term

Exposure Limit of 6 ppm for each of the PMN substance(s) , verified by actual exposure monitoring data (To pursue this option, a sampling and analytical method must be developed by the Company, verified by an independent third-party laboratory, and submitted to EPA.);

- not manufacture or import an aggregate amount of the PMN substance(s) beyond the following aggregate manufacture and importation volumes:
    - P-10-0455: 225,000 kg
    - P-10-489: 175,000 kg
    - P-10-457: 175,000 kg;
- not manufacture, process, or use the PMN substance(s) for purposes other than as chemical intermediates;
- distribute the PMN substance(s) outside the Company, other than for export or disposal, only to a person who has agreed in writing prior to the date of distribution to follow the same restrictions (except the testing requirements) and to not further distribute the PMN substance(s) except for export or disposal;
- maintain certain records.

III. CONTENTS OF PMN

By signing this Order, the Company represents that it has carefully reviewed this document and agrees that all information herein that is claimed as confidential by the Company is correctly identified within brackets and that any information that is not bracketed is not claimed as confidential. To make this document available for public viewing, EPA will remove only the information contained within the brackets.

Confidential Business Information Claims (Bracketed in the Preamble and Order):

Chemical Identity:

Specific:
P-10-0455: Propane, 1,1,1,2,3,3-hexafluoro- (CAS RN 431-63-0)
P-10-0489: 1-Propene, 1,2,3,3,3-pentafluoro- (CAS RN 2252-83-7)
P-10-0457: Propane, 1,1,1,2,3-pentafluoro- (CAS RN 431-31-2)

Use:

Specific:
P-10-0455: [redacted]
P-10-0489: [redacted]
P-10-0457: [redacted]

Generic:
P-10-0455: Intermediate
P-10-0489: Intermediate
P-10-0457: Intermediate

Maximum 12-Month Production Volume:

P-10-0455: [redacted]
P-10-0489: [redacted]
P-10-0457: [redacted]

Test Data Submitted with PMN:

P-10-0455:

- Vapor Pressure
- Liquid-liquid Equilibrium Measurements for Water and Four Fluorocarbons
- Flammability
- Absorbance and Transmittance Infrared Spectra
- Two-Week Inhalation Toxicity Study with HFC-236ea in Rats
- Mouse Bone Marrow Micronucleus Assay of HFC-236ea by Inhalation
- Acute Cardiac Sensitization Study of HFC-236ea in Dogs by-Inhalation
- Acute Inhalation Toxicity of HFC-236fa and HFC-236ea in the Rat
- In Vitro Assay of HFC-236ea for Chromosome Aberrations In Human Lymphocytes
- Mutagenicity Testing of HFC-236ea in the Salmonella Typhimurium and Escherichia Coli Plate Incorporation Assay
- Inhalation Developmental Toxicity Study of HFC-236ea in Rats
- 90-Day Inhalation Toxicity Study with HFC-236ea in Rats

P-10-0489:

- Vapor Pressure
- Octanol-water Partition Coefficient
- Flammability
- Liquid-liquid Equilibrium Measurements for Water and Four Fluorocarbons
- Inhalation approximate lethal concentration (ALC) in male rats
- Inhalation median lethal concentration (LC5 0) study in rats
- Four-week inhalation toxicity study with micronucleus evaluation in rats
- A 28-day whole-body inhalation toxicity study in beagle dogs
- 90-Day inhalation toxicity study in rats
- Bacterial reverse mutation test using gas-phase exposure
- In vitro mammalian chromosome aberration study using gas-phase exposure in human peripheral blood lymphocytes
- Four-week inhalation toxicity study with micronucleus evaluation in rats
- Pilot developmental toxicity study of in rats
- Inhalation prenatal developmental toxicity study of HFC-1225ye in rats
- Developmental toxicity study in rats
- Inhalation dose range-finding prenatal developmental toxicity study of IIFC-1225-ye in rabbits
- Inhalation dose range-finding prenatal developmental toxicity study of HFC-1225ye in rabbits
- One-generation reproduction study in rats
- Evaluation of metabolism in male and female rats using in vivo gas uptake exposure
- In vitro partition coefficients in human blood and rat blood, muscle, liver, and fat
- Investigation of the Cardiac Sensitization Potential and Measurement of Blood Levels Following Inhalation Administration to Beagle Dogs
- Comparative metabolism in male and female mouse, rat, dog, and human liver microsomes and cytosol and in male rat hepatocytes via oxidative dehalogenation and glutathione s-conjugation pathways
- HFC-A physiologically-based toxicokinetic (PBTK) model for analysis of the rate of metabolism of inhaled xenobiotics in a closed chamber gas uptake system
- A breath-by-breath physiologically-based toxicokinetic (BBB PBTK) model for analysis of inhaled xenobiotics in humans
- Application of a breath-by-breath
- PBTK model for analysis of occupational inhalation exposure and cardiac sensitization risk in humans
- Inhalation Median Lethal Concentration (LC50) (DRAFT)
- [redacted] temperature dependent OH rate coefficients and global warming potentials

P-10-0457:

- Vapor Pressure
- Liquid-liquid Equilibrium Measurements for Water and Four Fluorocarbons
- Flammability
- 5-Day Inhalation Toxicity Study in Rats

IV. EPA'S ASSESSMENT OF RISK

The following are EPA's predictions regarding the probable human and environmental toxicity, human exposure and environmental release of the PMN substance, based on the information currently available to the Agency.

Human Health Effects Summary:

In a review of the toxicity literature for P-10-0455 and P-10-0489, EPA developed NCELs for various toxicity endpoints for the fluorinated alkane (P-10-0455) and the fluorinated alkene (P-10-0489) from No Observed Adverse Effect Levels (NOAELs) or benchmark doses estimates. The table containing NOAELs, and a Benchmark Dose Level ("BMDL") along with corresponding NCELs is reproduced below. The NCELs were derived by dividing the NOAEL or BMDL by a factor of 10 to account for interspecies variability and another factor of 3 to protect the most sensitive individual in a healthy worker population.

Summary Table of Preliminary NCELs for PMNs P-10-0455 and P-10-0489

PMN	ENDPOINT	NOAEL	Preliminary BMDL	Preliminary NCEL
P-10-0455	Developmental	5000 ppm		166.7 ppm
P-10-0455	Reproductive	20000 ppm		666.7 ppm
P-10-0489	Developmental	50 ppm		1.7 ppm
P-10-0489	Reproductive		720.1 ppm	24.0 ppm

The reproductive effects from exposure to the fluorinated alkene (P-10-0489) were found in rabbits, a species often more sensitive for developmental and reproductive effects than rats. Only rats were tested for developmental and reproductive effects for the fluorinated alkane (P10-0455). Insufficient information was generated on P-10-0457 to develop a separate NCEL specific to this substance. As a consequence, the lowest NCEL for the fluorinated alkene (P-10-0489) will be applied to fluorinated alkanes (P-10-0455 & P-10-0457) until such time as developmental rabbit data are developed for the alkanes, showing adverse effects only at higher concentrations. This P-10-0489 NCEL is based on developmental effects evidenced by maternal and fetal weight loss at 150 ppm (LOAEL) with a corresponding NOAEL of 50 ppm.

An uncertainty factor of 3 will be used for interspecies variability since rabbits are often more sensitive than either rats or humans and the developmental effects were observed in rabbits. For uncertainty regarding intraspecies variability, an additional factor of 10 will be used as high variation in sensitivity has been observed within workers. In addition, EPA reviewed data showing that rats and rabbits absorb these fluorocarbons at a similar rate, which is consistently twice that of humans.

Dividing the developmental NOAEL of 50 ppm by the product of the above uncertainty factors (30) for the fluorinated alkene based on developmental effects yields 1.7 ppm. This concentration may be multiplied by 2 to account for more efficient absorption of the PMN substance(s) by rabbits compared to humans, to result in a NCEL rounded to 3 ppm. This multiple of 2, accounting for more efficient absorption by rabbits compared to humans, was based on a pharmacokinetic model provided by the submitter on a similar substance that was

reviewed and accepted by EPA (Risk Assessment Report for P-07-0601 dated 4-March-2009). This model calculates a human equivalent concentration that accounts for the difference in absorption between humans and rabbits and shows that rabbits absorb these volatile 3-carbon fluorinated hydrocarbons approximately twice as efficiently as humans via inhalation.

Environmental Effects Summary:

EPA predicted environmental effects to aquatic organisms to occur at 900 ppb, 590 ppb, and 630 ppb for PMNs P-10-0455, P-10-0489, and P-10-0457, respectively based on Structural-Activity Relationships for similar neutral organic compounds. Because the substances are expected to exist solely in the gaseous form in the environment, EPA expects these substances to present a low risk to aquatic organisms.

See www.epa.gov/opptintr/newchems/pubs/chemcat.htm

Under 40 CFR 20.98, P-10-0455 has been identified as possessing a high global warming potential (100-year GWP = 1370) by the EPA. Based on the low molecular weight and high volatility as well as carbon-halogen chemical bonding (associated with potential for radiative forcing) and low estimated degradation by OH radicals (associated with longer atomospheric lifetime), P-10-0457 is also expected to possess a high global warming potential.

Exposure and Environmental Release Summary: P-10-0455, P-10-0489, and P-10-0457

	Manufacture	Processing/Use	Consumer
# Sites	[redacted]	[redacted]	Not Expected
Workers (#/site)	[redacted]	[redacted]	Not Expected
Exposure (days/year)	[redacted] – P-10-0455 [redacted] – P-10-0489 [redacted] – P-10-0457	[redacted] – P-10-0455 [redacted] – P-10-0489 [redacted] – P-10-0457	Not Expected
Inhalation Exposure (mg/day) (part per million ["ppm"] concentrations)	5600 (90 ppm) – P-10-0455 5600 (91ppm) – P-10-0489 5600 (102 ppm) – P-10-0457	5600 (90 ppm) – P-10-0455 4900 (91 ppm) – P-10-0489 5600 (102 ppm) – P-10-0457	Not Expected

New Chemical Exposure Limit as an 8-hour time-weighted average ("TWA").

P-10-0455: 3 ppm
P-10-0489: 3 ppm
P-10-0457: 3 ppm

Short-Term Exposure Limit as a 15-minute time-weighted average ("TWA").

P-10-0455: 6 ppm
P-10-0489: 6 ppm
P-10-0457: 6 ppm

Risk to Workers:
Without exposure controls, monitoring, and/or personal protective equipment, workers are expected to be exposed to workplace concentrations exceeding the NCELs for the duration of their shifts.

	Exceedance Factor (Manufacturing)	Exceedance Factor (Processing/Use)
P-10-0455	30	30
P-10-0489	35	30
P-10-0457	34	34

NIOSH Assigned Protection Factor ("APF"):	50	– P-10-0455
	50	– P-10-0489
	50	– P-10-0457

Risk to General Public:
Based on the expected production volumes, use pattern, and releases, EPA does not expect these substances to present an unreasonable risk to the general public.

Risk to Consumers:
Based on the expected production volumes, use pattern, and releases, EPA does not expect these substances to present an unreasonable risk to the general public.

V. EPA'S CONCLUSIONS OF LAW

The following findings constitute the basis of the Consent Order:

(a) EPA is unable to determine the potential for developmental (P-10-0455, P-10-0457), and cardiac health (P-10-0457) effects and global warming potential (P-10-0457) from exposures to the PMN substance(s) . EPA therefore concludes, pursuant to § 5(e)(1)(A)(i) of TSCA, that the information available to the Agency is insufficient to permit a reasoned evaluation of the human health and environmental effects of the PMN substance(s) .

(b) In light of the potential risk of reproductive, developmental, and cardiac health effects and potential global warming environmental effects posed by the uncontrolled manufacture, import, processing, distribution in commerce, use, and disposal of the PMN substance(s) , EPA has concluded, pursuant to § 5(e)(1)(A)(ii)(I) of TSCA, that uncontrolled manufacture, import, processing, distribution in commerce, and use of the PMN substance(s) may present an unreasonable risk of injury to human health and the environment.

VI. INFORMATION REQUIRED TO EVALUATE HEALTH EFFECTS

Pended Testing. The following additional information would be required to evaluate the following effects which may be caused by the PMN substance(s) :

Information	Effects	Guidelines
Cardiac sensitization (P-10-0457)	Cardiac	Study design from the Acute Cardiac Sensitization Study of HFO 1234ze and HFO 1234yf in Dogs as described in PMN P-07-0601
Pre-natal developmental toxicity study in rabbits for P-10-0455 and P-10-0457	Developmental	OECD Test Guideline 414
Infrared spectrum for P-10-0457	Fate: Global Warming Potential	OECD Test Guideline 101 Including integrated area of absorbance with particular interest between 500 and 1500 cm-1. Note database of measured data available through NIST http://webbook.nist.gov/chemistry/coblentz/
Reaction Rate with Hydroxyl Radicals for P-10-0457	Fate: Global Warming Potential	Pitts Jr, JN, Winer, AM, Aschmann, SM, Carter, WPL, Atkinson, R. "Experimental Protocol for Determining Hydroxyl Radical Reaction Rate Constants for Organic Compounds: Estimation of Atmospheric Reactivity." EPA Report 600/S3-85/058, Sept. 1985, EPA Atmospheric Sciences Research Laboratory, Research Triangle Park, NC 27711. Edney, EO and Corse, EW. "Validation of measured OH Radical Rate Constant." EPA Report 600/S3-86/O13, May 1986, EPA Atmospheric Sciences Research Laboratory, Research Triangle Park, NC 27711. Note database of measured data available through NIST Chemical Kinetics Database http://kinetics.nist.gov/kinetics/index.jsp

The Order does not require submission of the above pended testing at any specified time or production volume. However, the Order's restrictions on manufacture, import, processing, distribution in commerce, and use of the PMN substance(s) will remain in effect until the Order is modified or revoked by EPA based on submission of that or other relevant information.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

CONSENT ORDER

I. SCOPE OF APPLICABILITY AND EXEMPTIONS

(a) Scope. The requirements of this Order apply to all commercial manufacturing, processing, distribution in commerce, use and disposal of the chemical substances Propane, 1,1,1,2,3,3-hexafluoro- (P-10-0455; CAS RN 431-63-0), 1-Propene, 1,2,3,3,3-pentafluoro- (P-10-0489; CAS RN 2252-83-7), and Propane, 1,1,1,2,3-pentafluoro- (P-10-0457; CAS RN 431-31-2) (in this Consent Order, these substances may individually or collectively be referred to as the "PMN substance(s)"), respectively, submitted by Honeywell Chemicals ("the Company"),except to the extent that those activities are exempted by paragraph (b).

(b) Exemptions. Manufacturing, processing, distribution in commerce, use and disposal of the PMN substance(s) are exempt from the requirements of this Order (except the requirements in the Recordkeeping and Successor Liability Upon Transfer Of Consent Order sections) only to the extent that (1) these activities are conducted in full compliance with all applicable requirements of

the following exemptions, and (2) such compliance is documented by appropriate recordkeeping as required in the Recordkeeping section of this Order.

(1) De Minimis Concentrations. The requirements of this Order do not apply to quantities of the PMN substance(s) that are (1) present in the work area only as a mixture and (2) at a concentration not to exceed 1.0 percent by weight or volume (0.1 percent by weight or volume if the PMN substance(s) are identified as a potential carcinogen in paragraph (f) of the Hazard Communication Program section of this Order). This exemption is not available if the Company has reason to believe that, during intended activities, the PMN substance(s) in the mixture may be reconcentrated above the 1.0 or 0.1 percent level, whichever applies. If this Order contains New Chemical Exposure Limits provisions or Release to Water provisions that, respectively, specify a NCEL concentration ("TWA") or in-stream concentration ("N") less than the de minimis concentration specified here, then this de minimis exemption does not apply to those provisions.

(2) Export. Until the Company begins commercial manufacture of the PMN substance(s) for use in the United States, the requirements of this Order do not apply to manufacture, processing or distribution in commerce of the PMN substance(s) solely for export in accordance with TSCA §12(a) and (b), 40 CFR 720.3(s) and 40 CFR Part 707. However, once the Company begins to manufacture the PMN substance(s) for use in the United States, no further activity by the Company involving the PMN substance(s) is exempt as "solely for export" even if some amount of the PMN substance(s) is later exported. At that point, the requirements of this Order apply to all activities associated with the PMN substance(s) while in the territory of the United States. Prior to leaving U.S. territory, even those quantities or batches of the PMN substance(s) that are destined

for export are subject to terms of the Order, and count towards any production volume triggers in the Testing section of this Order.

(3) Research & Development ("R&D"). The requirements of this Order do not apply to manufacturing, processing, distribution in commerce, use and disposal of the PMN substance(s) in small quantities solely for research and development in accordance with TSCA §5(h)(3), 40 CFR 720.3(cc), and 40 CFR 720.36. The requirements of this Order also do not apply to manufacturing, processing, distribution in commerce, use and disposal of the PMN substance(s) when manufactured solely for non-commercial research and development per 40 CFR 720.30(i) and TSCA §5(i).

(4) Byproducts. The requirements of this Order do not apply to the PMN substance(s) when they are produced, without separate commercial intent, only as a "byproduct" as defined at 40 CFR 720.3(d) and in compliance with 40 CFR 720.30(g).

(5) No Separate Commercial Purpose. The requirements of this Order do not apply to the PMN substance(s) when they are manufactured, pursuant to any of the exemptions in 40 CFR 720.30(h), with no commercial purpose separate from the substance, mixture, or article of which they are a part.

(6) Imported Articles. The requirements of this Order do not apply to the PMN substance(s) when they are imported as part of an "article" as defined at 40 CFR 720.3(c) and in compliance with 40 CFR 720.22(b)(1).

(c) Automatic Sunset. If the Company has obtained for the PMN substance(s) Test Market Exemptions ("TMEs") under TSCA §5(h)(1) and 40 CFR 720.38 or Low Volume Exemptions

("LVEs") or Low Release and Exposure Exemptions ("LoREXs") under TSCA §5(h)(4) and 40 CFR 723.50(c)(1) and (2) respectively, any such exemptions are automatically rendered null and void as of the effective date of this Consent Order.

II. TERMS OF MANUFACTURE, IMPORT, PROCESSING, DISTRIBUTION IN COMMERCE, USE, AND DISPOSAL PENDING SUBMISSION AND EVALUATION OF INFORMATION

PROHIBITION

The Company is prohibited from manufacturing, importing, processing, distributing in commerce, using, or disposing of the PMN substance(s) in the United States, for any nonexempt commercial purpose, pending the development of information necessary for a reasoned evaluation of the human health of the substance, and the completion of EPA's review of, and regulatory action based on, that information, except in accordance with the conditions described in this Order.

TESTING

(a) Section 8(e) Reporting. Reports of information on the PMN substance(s) which reasonably supports the conclusion that the PMN substance(s) presents a substantial risk of injury to health or the environment and which is required to be reported under TSCA section 8(e) shall reference the appropriate PMN identification numbers for these substance(s) and contain a statement that the substance(s) is subject to this Consent Order. Additional information regarding section 8(e) reporting requirements can be found at www.epa.gov/oppt/tsca8e.

(b) Notice of Study Scheduling. The Company shall notify, in writing, the EPA Laboratory Data Integrity Branch (2225A), Office of Enforcement and Compliance Assurance, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460, of the following information within 10 days of scheduling any study required to be performed pursuant to this Order, or within 15 days after the effective date of this Order, whichever is later:

(1) The date when the study is scheduled to commence;

(2) The name and address of the laboratory which will conduct the study;

(3) The name and telephone number of a person at the Company or the laboratory whom EPA may contact regarding the study; and,

(4) The appropriate PMN identification number for each substance(s) and a statement that the substance(s) is subject to this Consent Order.

(c) Good Laboratory Practice Standards and Test Protocols. Each study required to be performed pursuant to this Order must be conducted according to TSCA Good Laboratory Practice Standards at 40 CFR Part 792 and using methodologies generally accepted in the relevant scientific community at the time the study is initiated. Before starting to conduct any such study, the Company must obtain approval of test protocols from EPA by submitting written protocols. EPA will respond to the Company within 4 weeks of receiving the written protocols. Published test guidelines specified in paragraph (d) provide general guidance for development of test protocols, but are not themselves acceptable protocols. Approval of the test protocol does not mean pre-acceptance of test results.

(d) Other Requirements. Regardless of the satisfaction of any other conditions in this Testing section, the Company must continue to obey all the terms of this Consent Order until otherwise notified in writing by EPA. The Company may, based upon submitted test data or other relevant information, petition EPA to modify or revoke provisions of this Consent Order pursuant to Part VI. of this Consent Order.

PROTECTION IN THE WORKPLACE

(a) Establishment of Program. During manufacturing, processing, and use of the PMN substance(s) at any site controlled by the Company (including any associated packaging and storage and during any cleaning or maintenance of equipment associated with the PMN substance(s)), the Company must establish a program whereby:

(1) Respiratory Protection. Each person who is reasonably likely to be exposed by inhalation in the work area to the PMN substance(s) in the form listed in subparagraph (a)(2) of this section, is provided with, and is required to wear, at a minimum, a National Institute for Occupational Safety and Health ("NIOSH")-certified respirator with an Applied Protection Factor ("APF") of 50 from the respirators listed in subparagraph (a)(3) of this section, and the respirator is used in accordance with OSHA and NIOSH respiratory protection requirements at 29 CFR 1910.134 and 42 CFR Part 84. All respirators must be issued, used, and maintained according to an appropriate respiratory protection program under the OSHA requirements in 29 CFR 1910.134.

(2) Physical States. The following physical states of airborne chemical substance(s) are listed for subparagraph (a)(1) and (4) of this section:

(i) Gas/vapor (all substance(s) in the gas form)

(3) Authorized Respirators. The following NIOSH-certified respirators meet the minimum requirements for subparagraph (a)(1) of this section:

If Data on Cartridge Service Life Testing has been Reviewed and Approved by EPA:

(i) NIOSH-certified air-purifying, tight-fitting full-face respirator equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific).

(ii) NIOSH-certified powered air-purifying, tight-fitting respirator (either half-face or full-face) equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific).

(iii) NIOSH-certified supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a tight-fitting facepiece (half-face or full-face).

If No Cartridge Service Life Testing is Available:

(i) NIOSH-certified supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a tight-fitting full facepiece.

NEW CHEMICAL EXPOSURE LIMIT

(a) Alternative to Requirements of Respirator Section.

(1) EPA recommends and encourages the use of pollution prevention, source reduction, engineering controls and work practices, rather than respirators, as a means of controlling inhalation exposures whenever practicable.

(2) Whenever a person is reasonably likely to be exposed to the PMN substance(s) by inhalation, as an alternative to compliance with the respirator requirements in the Protection in the Workplace section of this Order, the Company may comply with the requirements of this New

Chemical Exposure Limit section. However, before the Company may deviate from the respirator requirements in the Protection in the Workplace section of this Order, the Company must:

(i) submit to EPA a copy of the Company's sampling and analytical method for the PMN substance, verified in accordance with subsection (c)(3) of this New Chemical Exposure Limit section;

(ii) obtain exposure monitoring results in accordance with this New Chemical Exposure Limit section; and

(iii) based on those exposure monitoring results, select, provide, and ensure use if necessary of the appropriate respiratory protection specified in paragraph (e)(2) of this New Chemical Exposure Limit section by persons who are reasonably likely to be exposed to the PMN substance(s) by inhalation.

(3) After appropriate respiratory protection has been selected at a workplace based on the results of actual exposure monitoring conducted in accordance with this New Chemical Exposure Limit section, the Company shall not, at that workplace, use the respiratory protection required in the Protection in the Workplace section of this Order (unless it is the same as required by this New Chemical Exposure Limit section).

(b) Exposure Limit.

(1) General. The following new chemical exposure limit ("NCEL") for the PMN substance(s) is an interim level determined by EPA based on the limited information available to the Agency at the time of development of this Order. The NCEL for the PMN substance(s) is as follows:

(i) Time-Weighted Average ("TWA") Limit. The Company shall ensure that no person is exposed to an airborne concentration of any of the PMN substances in excess of 3 parts per million ("ppm") (the NCEL) as an 8-hour time-weighted average, without using a respirator in accordance with subsection (e) of this New Chemical Exposure Limit section.

(ii) Non-8-Hour Work-shifts. For non-8-hour work-shifts, the NCEL for that work-shift (NCELn) shall be determined by the following equation: NCELn = NCEL x (8/n) x [(24-n)/16], where n = the number of hours in the actual work-shift.

(iii) Short-Term Exposure Limit ("STEL"). The Company shall ensure that no person is exposed to an airborne concentration of any of the PMN substances in excess of 6 ppm as averaged over any 15-minute period, without using a respirator in accordance with subsection (e) of this New Chemical Exposure Limit section.

(2) Automatic Sunset. If, subsequent to the effective date of this Order, OSHA promulgates, pursuant to §6 of the Occupational Safety and Health Act, 29 U.S.C. 655, a final chemical-specific permissible exposure limit ("PEL") specifically applicable to any of these PMN substance(s) and the OSHA PEL is not challenged in court within 60 days of its promulgation, then any respirator requirements in the Protection in the Workplace section of this Order and any requirements of this New Chemical Exposure Limit section applicable to workers and situations subject to the OSHA PEL shall automatically become null and void. However, the requirements of this Consent Order are not negated by any pre-existing OSHA PEL applicable to the PMN substance(s) .

(c) Performance-Criteria for Sampling and Analytical Method.

(1) Applicability. For initial development and validation of the sampling and analytical method for the PMN substance, all the requirements of this subsection (c) apply. For subsequent exposure monitoring conducted pursuant to subsection (d) of this New Chemical Exposure Limit section, only the following requirements apply: (c)(4)(i), (4)(ii), (4)(iv)(B), (4)(v)(B), (8), (9), and (10). Any deviation from the requirements of this subsection (c) must be approved in writing by EPA.

(2) Submission of Verified Method and Certification Statement. The Company shall submit to EPA a copy of a validated sampling and analytical method for the PMN substance(s) which satisfies the criteria specified in this subsection (c). The method description shall expressly state how the method compares with each quantitative requirement specified in this subsection (c). The submission must include a written statement, signed by authorized officials of both the Company and the Laboratory, certifying the truth and accuracy of the independent laboratory verification conducted pursuant to subsection (c)(3). To assist EPA in identifying the document, it shall state in a conspicuous, underlined subject-line at the top of the first page: "NCEL Sampling and Analytical Method for PMN #_____," after-which the correct PMN number for the chemical substance(s) shall be stated.

(3) Verification of Analytical Method by Independent Third-Party Laboratory.

(i) Verification. The Company shall have an independent reference laboratory ("Laboratory") verify the validity of the analytical method for the PMN substance(s), in accordance with the other requirements in this subsection (c)(3). It is the Company's responsibility to ensure that the Laboratory complies with all the requirements specified in this subsection (c)(3).

(ii) Independent Reference Laboratory. The independent reference laboratory must be a separate and distinct person (as defined at 40 CFR 720.3(x)) from the Company and from any other person who may have developed the method for the Company.

(iii) Accreditation. The Laboratory must be accredited by a formally recognized government or private laboratory accreditation program for chemical testing and/or analysis.

(iv) Good Laboratory Practice Standards. The Laboratory verification of the analytical method for the PMN substance(s) must comply with TSCA Good Laboratory Practice Standards ("GLPS") at 40 CFR Part 792. [Certain provisions of the TSCA GLPS applicable to toxicity testing in laboratory animals, such as 40 CFR 792.43 ("Test system care facilities"), 792.45 ("Test system supply facilities") and 792.90 ("Animal and other test system care"), are clearly inapplicable to the NCEL requirements.] However, compliance with TSCA GLPS is not required under this New Chemical Exposure Limit section where the analytical method is verified by a laboratory accredited by either: (A) the American Industrial Hygiene Association ("AIHA") Industrial Hygiene Laboratory Accreditation Program ("IHLAP"); or (B) another comparable program approved in advance in writing by EPA.

(v) Analysis of Duplicate Samples. The Company shall collect six duplicate samples (a total of 12) at the TWA concentration. The samples shall be taken either from a controlled environment (e.g., a sealed chamber or "glove box") which closely resembles the actual workplace conditions or, for solids and liquids with very low vapor pressure, by injecting the PMN substance(s) onto a sample collection device. The duplicate samples shall be collected on identical collection media, at the same time, and under the same conditions. One set of six samples shall immediately be analyzed by the Company, the other set of six samples shall be analyzed by the

Laboratory using the method developed by or for the Company.

(vi) Sample Storage Study. If the results of the analysis of duplicate samples pursuant to paragraph (c)(3)(v) do not satisfy the requirements in paragraph (c)(3)(vii), the Company must perform a sample storage study as follows:

(I) Triplicate Samples. The Company shall collect six triplicate samples (a total of 18) at the TWA concentration. The samples shall be taken either from a controlled environment (e.g., a sealed chamber or "glove box") which closely resembles the actual workplace conditions or, for solids and liquids with very low vapor pressure, by injecting the PMN substance(s) onto a sample collection device. The triplicate samples shall be collected on identical collection media, at the same time, and under the same conditions. One set of six samples shall immediately be analyzed by the Company.

(II) Analysis After Sample Storage. A sample storage evaluation shall be performed with the two remaining sets of six samples. One set of six samples shall be analyzed by the Laboratory using the method developed by or for the Company, and the other shall be analyzed by the Company on the same day as the Laboratory analyzes its six samples. Specialized storage conditions for the samples including extraction conditions, time from sampling to extraction, time from collection or extraction (if applicable) to analysis and storage conditions must be specified in the method description.

(vii) Comparison of Results. The difference between the results of the two sets of six samples analyzed by the Laboratory and the Company as required in either paragraph (c)(3)(v) or (c)(3)(vi)(II) shall be evaluated using a two-sample t-test with unequal variances, and the two sides of the critical regions shall not exceed a 5% significance level. (See Attachment B -

Statistical Analysis of NCELs Analytical Method Verification Results.) The arithmetic mean of each set of six samples must be within 10% of the overall arithmetic mean of the two sets of sample measurements. If the arithmetic mean of each set of six samples is not within 10% of the overall arithmetic mean, then the sample storage time between collection and analysis must be reduced until the average of each set of six samples is within 10% of the overall arithmetic mean.

(4) Accuracy. The sampling and analytical method must clearly demonstrate the following:

(i) General. The sampling and analytical method, and all exposure monitoring data relied on by the Company, shall be accurate to within ±25% at a 95% confidence level for concentrations of the PMN substance(s) ranging from one half the NCEL to twice the NCEL.

(ii) NCEL Quantitation Limits. The analytical method should be capable of reliably quantifying the PMN substance(s) across the full range of reasonably likely exposures. At a minimum, the analytical method must be capable of reliably quantifying from a lower quantitation limit ("LQL") of one half the NCEL to an upper quantitation limit ("UQL") of at least twice the NCEL. If the Company obtains an exposure monitoring sample that is more than 10% above the actual UQL of the analytical method, the Company must comply with paragraph (e)(4)(i).

(iii) Lower Quantitation Limit Signal-To-Noise Ratio. The analytical method shall be capable of quantifying the PMN substance(s) to a concentration of one half the NCEL with a signal that is at least five times the baseline noise level. Baseline noise must be amplified to a measurable level when possible, even if the required amplification is beyond that used in routine analysis of samples. (If baseline noise cannot be obtained, another reference must be selected.

This may be a peak considered to be noise caused by the reagent matrix.) The sampling preparation method must be specified and the detection limit for the analytical procedure must be reported as mass per injection for chromatographic techniques.

(iv) Instrument Calibration.

(I) Initial Calibration. For method development and validation (but not subsequent exposure monitoring), the initial calibration shall at a minimum consist of five (5) calibration standards with a linear correlation of 0.95 -- these five (5) calibration standards must consist of one standard at each of the following concentrations: one half the NCEL (0.5 x NCEL); between one half and one times the NCEL (0.5 x NCEL < > 1 x NCEL); one times the NCEL (1 x NCEL); between one and two times the NCEL (1 x NCEL < > 2 x NCEL), and twice the NCEL (2 x NCEL).

(II) Continuing Calibration. During each week of both method development/validation and subsequent exposure monitoring, the Company shall conduct both an initial instrument calibration and a continuing calibration. The Company shall perform at least one continuing calibration sample at the NCEL concentration, and at least one additional calibration sample per every 10 samples analyzed. The continuing calibration sample shall fall within $\pm$ 25% of the initial calibration value. If not, then the initial calibration must be repeated, and any samples associated with that outlying calibration check must be re-analyzed.

(v) Calculated Percent Recovery.

(I) Initial Calculation. For method development and validation, the Company must calculate the percent of the PMN substance(s) recovered by the analytical method from a sample containing a known quantity of the PMN substance. The sample shall be taken

either from a controlled environment (e.g., a sealed chamber or "glove box") which closely resembles the actual workplace conditions or, for solids and liquids with very low vapor pressure, by injecting the PMN substance(s) onto a sample collection device. (Such a sample is referred to as a "matrix spike"). The calculated percent recovery for each matrix spike shall be greater than or equal to 75% and less than or equal to 125%. Spike concentrations for the PMN substance(s) must be included in the sampling and analytical method submitted to EPA.

(II) Subsequent Calculation. During each subsequent exposure monitoring episode or campaign, at least 1 matrix spike, prepared by injecting the PMN substance(s) onto a sample collection device, shall be analyzed. (This matrix spike must be prepared at the NCEL concentration.)

(vi) Sampling Device Capacity. The capacity of the sampling device must be tested and results reported to show under a known and well-defined set of conditions that the device is capable of collecting the new chemical in solid, liquid or vapor phase with minimal loss. The sampling device's capacity (air volume and collected analyte mass) must be specified. For methods that use adsorbent tubes as the collection medium, evidence of the capacity must be provided in the form of breakthrough testing. This testing must be done at a concentration twice the NCEL and under conditions similar to those expected in the workplace. Breakthrough is defined to have occurred when the concentration of the PMN substance(s) in the effluent stream is equal to 5% of the concentration of the influent stream, or when 20% of the PMN substance(s) is detected in the backup section of the sampler.

(vii) Sampling Device Desorption Efficiency. Where applicable, the desorption efficiency must be evaluated for the air sampling device. A minimum of six air samples spiked

with the PMN substance(s) at least the NCEL concentration must be prepared. A recovery of at least 75% must be obtained for each of the six samples.

(5) Precision. The estimate of the coefficient of variation of each set of six samples from the controlled atmosphere test (spiked at 1.0 NCEL, per paragraphs (c)(3)(v) or (vi)) must be less than 0.105, including allowance of 0.05 for error due to sampling.

(6) Interpretation of Accuracy and Precision Data.

(i) If a single matrix spike recovery is less than 75% recovery or greater than 125% or the estimated precision is greater than 0.105, then the Company must re-prepare the matrix spike, re-sample, and re-analyze all samples associated with such matrix spike or triplicate samples.

(ii) For percent recoveries less than 90% but greater than 75%, correction for low recovery is required. Correct for recovery first by dividing the observed amount by the proportion recovered before determining if measurements fall below the NCEL. For example, if the observed level is 30 mg/m^3 and the percent recovery is 75%, use the value 30 $mg/m^3/(0.75) = 40$ mg/m^3 when determining whether the levels are below the exposure limit.

(7) Representativeness. All sample conditions used to develop the methodology shall mimic the actual workplace environment expected to be monitored. Conditions such as the temperature, humidity, lighting, and presence of other chemicals, etc. must mimic the conditions in the workplace to be monitored.

(8) Changes Affecting Validity. If the workplace environment changes from the initial conditions described in the verified sampling and analytical method in a way reasonably likely to invalidate the accuracy of the method, then the Company must comply with the respirator

requirements in the Protection in the Workplace section of this Order, unless the Company re-validates the method to confirm that the requirements for accuracy and precision in paragraphs (c)(4) and (5) are met. Examples of possible changes include but are not limited to: introduction of a new chemical substance(s) to the workplace which may interfere with the analysis of the new chemical; introduction of light to the workplace which may interfere with a light-sensitive PMN substance; or introduction of water/increased humidity to the workplace which could react with the PMN substance(s) and cause difficulties in collection and analysis.

(9) Comparability. All data and results shall be reported in the same units of measurement as the NCEL.

(10) Responsibility for Method Validity. The independent laboratory verification and EPA receipt of the sampling and analytical method pursuant to this subsection (c) do not ensure that the method will produce valid exposure monitoring data. The Company is ultimately responsible for ensuring the validity of its exposure monitoring data.

(d) Monitoring Potential Exposure.

(1) General.

(i) Action Level. The "action level" is defined as an airborne concentration of the PMN substance, calculated as an 8-hour time-weighted average, equal to one half the NCEL TWA specified in subparagraph (b)(1). For non-8-hour work shifts, the action level is equal to one half the NCELn. (The NCELn is described in subparagraph (b)(1)(ii).) The Company may exceed the action level without penalty. The purpose of the action level is solely to determine the requisite monitoring frequency.

(ii) Representative Exposure Groups. Whenever exposure monitoring is required by this New Chemical Exposure Limit section, the Company shall take representative samples of what the potential exposure of each person who is reasonably likely to be exposed to airborne concentrations of the PMN substance(s) would be if respirators were not worn. The Company shall do so by sampling the breathing zone air of at least one person that represents, and does not underestimate, the potential exposure of every person performing the same or substantially similar operations in each work shift, in each job classification, in each work area (hereinafter identified as an "exposure group") where inhalation exposures to the PMN substance(s) are reasonably likely to occur. The exposure of each person need not be itself directly sampled if that exposure is represented by sampling the exposure of another person in the same exposure group.

(iii) Good Laboratory Practice Standards. Determinations of potential inhalation exposure shall be made according to TSCA Good Laboratory Practice Standards at 40 CFR Part 792 and the sampling and analytical method developed pursuant to subsection (c) of this New Chemical Exposure Limit section. [Certain provisions of the TSCA GLPS applicable to toxicity testing in laboratory animals, such as 40 CFR 792.43 ("Test system care facilities"), 792.45 ("Test system supply facilities") and 792.90 ("Animal and other test system care"), are clearly inapplicable to the NCEL requirements.] However, compliance with TSCA GLPS is not required where exposure monitoring samples are analyzed by a laboratory accredited by either: (A) the American Industrial Hygiene Association ("AIHA") Industrial Hygiene Laboratory Accreditation Program ("IHLAP"); or (B) another comparable program approved in advance in writing by EPA.

(iv) Full Shift Exposure Samples. Representative 8-hour TWA airborne concentrations shall be determined on the basis of samples representing the full shift exposure for

each exposure group.

(v) STEL Samples. Determinations of compliance with the STEL shall be made from 15 minute breathing zone samples measured at operations where there is reason to believe that the maximum short-term exposures will occur, such as during, but not limited to, the following operations: Sampling and Connecting/Disconnecting Cylinders.

(2) Initial Monitoring. Before the Company may deviate from the respirator requirements of the Protection in the Workplace section, the Company shall conduct initial exposure monitoring to accurately determine the airborne concentration of the PMN substance(s) for each exposure group in which persons are reasonably likely to be exposed to the PMN substance(s).

(3) Periodic Monitoring.

(i) If any representative samples taken during the initial exposure monitoring reveal an airborne concentration at or above the action level but at or below the TWA, the Company shall repeat the exposure monitoring for that exposure group at least every 6 months. If the PMN substance(s) are not manufactured, processed, or used at all during a given 6 month calendar period, the Company is not required to conduct exposure monitoring until manufacture, processing, or use of the PMN substance(s) is resumed. However, cessation of manufacturing, processing and use of the PMN substance(s) for less than the 6 month period does not constitute grounds for postponement of the 6 month deadline to conduct exposure monitoring.

(ii) If any representative samples taken during the initial exposure monitoring reveal an airborne concentration above the TWA, the Company shall repeat the exposure monitoring for that exposure group at least every 3 months. If the PMN substance(s) are not manufactured, processed, or used at all during a given 3 month calendar period, the Company is

not required to conduct exposure monitoring until manufacture, processing, or use of the PMN substance(s) is resumed. However, cessation of manufacturing, processing and use of the PMN substance(s) for less than the 3 month period does not constitute grounds for postponement of the 3 month deadline to conduct exposure monitoring.

(iii) The Company may alter the exposure monitoring schedule from every 3 months to every 6 months for any exposure group for whom two consecutive measurements taken at least 7 days apart indicate that the potential exposure has decreased to the TWA or below, but is at or above the action level. Where the PMN substance(s) are manufactured, processed, or used in batches of duration less than 7 days, the 2 consecutive measurements may be taken at least 24 hours apart, provided that the measurements accurately reflect the highest peak exposures and variability in exposure.

(4) Termination of Monitoring.

(i) If representative samples taken during the initial exposure monitoring reveal an airborne concentration below the action level, the Company may discontinue monitoring for that exposure group, except when additional exposure monitoring is required by paragraph (d)(5) of this New Chemical Exposure Limit section.

(ii) If representative samples taken during the periodic monitoring reveal that an airborne concentration, as indicated by at least 2 consecutive measurements taken at least 7 days apart, are below the action level, the Company may discontinue the monitoring for that exposure group, except when additional monitoring is required by paragraph (d)(5) of this New Chemical Exposure Limit section. Where the PMN substance(s) are manufactured, processed, or used in batches of duration less than 7 days, the 2 consecutive measurements may be taken at least 24

hours apart, provided that the measurements accurately reflect the highest peak exposures and variability in exposure.

(5) Additional Monitoring.

(i) For a previously monitored exposure group, the Company shall, within 7 days of any of the events listed below in this paragraph (d)(5)(i), conduct the initial exposure monitoring followed by any periodic or additional exposure monitoring required by subsection (d) of this New Chemical Exposure Limit section:

(I) change in the production volume, process, control equipment, personnel or work practices that may reasonably cause new or additional exposures to the PMN substance(s);

(II) spills, leaks, ruptures or other breakdowns occur that may reasonably cause new or additional exposures to the PMN substance(s); and,

(III) whenever else the Company has any reason to suspect a change that may reasonably result in new or additional exposures to the PMN substance(s).

(ii) In no event is the additional exposure monitoring requirement in paragraph (d)(5)(i) intended to delay implementation of any necessary cleanup or other remedial action. During any cleanup or remedial operations that may occur before commencing additional exposure monitoring, the Company shall ensure that potentially exposed persons use at least the respiratory protection specified in subsection (e) for the measured airborne concentration, or more protective respiratory equipment deemed appropriate by the best professional judgment of a qualified expert.

(6) Notification of Monitoring Results.

(i) Within 15 working days after receipt of the results of any exposure monitoring required by this Order, the Company shall notify each person whose exposure is represented by

that monitoring. The notice shall identify the NCEL, the exposure monitoring results, and any corresponding respiratory protection required by subsection (e). Affected persons shall be notified in writing either individually or by posting the information in an appropriate and accessible location.

(ii) Whenever the NCEL is exceeded, the written notification required by the preceding paragraph shall describe the action being taken by the Company to reduce inhalation exposure to or below the NCEL, or shall refer to a document available to the person which states the actions to be taken to reduce exposure.

(7) Exemption based on Objective Data. Where the Company has documented and reliable objective data demonstrating that, even under worst-case conditions, employee exposure to the PMN substance(s) will not exceed the action level (defined in paragraph (d)(1)(i)) under the expected handling procedures and conditions for a specific "exposure group" (defined in paragraph (d)(1)(ii)), then that exposure group is exempt from this New Chemical Exposure Limit section (except paragraph (d)(5) "Additional Monitoring" and subsection (f) "NCEL Record-keeping") and the respirator requirements in the Protection in the Workplace section of this Order. Any such objective data must accurately characterize actual employee exposures to the PMN substance(s) and must be obtained under conditions closely resembling the types of materials, processes, control methods, work practices, and environmental conditions in the Company's current workplace operations with the PMN substance(s). Examples of objective data that may be used to demonstrate that employee exposure will not exceed the action level, even under worst case conditions, include information on the physical and chemical properties of the PMN substance(s), industry-wide studies, and/or laboratory test results.

(e) Respiratory Protection.

(1) General. Whenever the Company has conducted exposure monitoring at a workplace in accordance with subsection (d) of this New Chemical Exposure Limit section and the measured airborne concentration of the PMN substance(s) for any person who is reasonably likely to be exposed to the PMN substance(s) by inhalation exceeds the NCEL, the Company shall provide those persons the respirators specified in this subsection (e) (rather than the respirator(s) identified in the Protection in the Workplace section of this Order), and shall ensure that the respirators are used (including training, fit testing, and maintenance) in accordance with OSHA and NIOSH respiratory protection requirements at 29 CFR 1910.134 and 42 CFR Part 84. When the Company has not yet measured the airborne concentration of the PMN substance(s) at a workplace in accordance with this New Chemical Exposure Limit section, the Company shall comply with the respirator requirements in the Protection in the Workplace section of this Order at that workplace.

(2) Selection of Appropriate Respiratory Protection. After the Company has conducted exposure monitoring in accordance with subsection (d) of this New Chemical Exposure Limit section, the Company shall select, provide, and ensure that persons who are reasonably likely to be exposed to the PMN substance(s) by inhalation use, at a minimum, the respiratory protection which corresponds in the following table to the measured airborne concentration (or a more protective respirator which corresponds to a concentration higher than measured).

GAS/VAPOR RESPIRATOR TABLE

Measured Concentration of PMN Substance	**Required Respiratory Protection**
≤ NCEL	▶ No respiratory protection is required.
≤ 10 x NCEL	*If Data on Cartridge Service Life Testing has been Reviewed and Approved by EPA:* ▶ NIOSH-certified air-purifying, tight-fitting half-face respirator equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific). ▶ NIOSH-certified air-purifying, tight-fitting full-face respirator equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific). ▶ NIOSH-certified powered air-purifying respirator equipped with a loose fitting hood or helmet and equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific). ▶ NIOSH-certified powered air-purifying respirator equipped with a tight-fitting facepiece (half-face or full-face) and equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific). ▶ NIOSH-certified supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a hood or helmet, or tight-fitting facepiece (half-face or full-face). *If No Cartridge Service Life Testing is Available:* ▶ NIOSH-certified supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a loose fitting hood or tight-fitting facepiece (either half-face or full-face).
≤ 25 x NCEL	*If Data on Cartridge Service Life Testing has been Reviewed and Approved by EPA:*

► NIOSH-certified air-purifying, tight-fitting full-face respirator equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific).

► NIOSH-certified powered air-purifying respirator equipped with a loose-fitting hood or helmet and the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific).

► NIOSH-certified powered air-purifying respirator with a tight-fitting facepiece (half-face or full-face) and equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific).

► NIOSH-certified supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a hood or helmet, or tight-fitting facepiece (half-face or full-face).

If No Cartridge Service Life Testing is Available:

► NIOSH-certified supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a loose-fitting hood or helmet or a tight-fitting facepiece (half-face or full-face).

≤ 50 x NCEL

If Data on Cartridge Service Life Testing has been Reviewed and Approved by EPA:

► NIOSH-certified air-purifying, tight-fitting full-face respirator equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific).

► NIOSH-certified powered air-purifying, tight-fitting respirator (either half-face or full-face) equipped with the appropriate gas/vapor cartridges (organic vapor, acid gas, or substance-specific).

► NIOSH-certified supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a tight-fitting facepiece (half-face or full-face).

If No Cartridge Service Life Testing is Available:

► NIOSH-certified supplied-air respirator operated in pressure demand or continuous flow mode and equipped with a tight-fitting full facepiece.

≤ 2000 x NCEL

► NIOSH-certified supplied-air respirator operated in pressure demand or other positive pressure mode and equipped with a tight-fitting full facepiece.

> 2000 x NCEL	▶ Any self-contained respirator equipped with a full facepiece and operated in a pressure demand or other positive pressure mode. ▷ Any supplied-air respirator equipped with a full facepiece operated in a pressure demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in a pressure demand or other positive pressure mode.

(3) Reductions in Respiratory Protection. After appropriate respiratory protection has been selected based on the results of actual exposure monitoring conducted at a workplace in accordance with subsection (d) of this New Chemical Exposure Limit section, the Company shall not, at that workplace, use the respiratory protection required by the Protection in the Workplace section of this Order (unless it is the same as required by this New Chemical Exposure Limit section). Before the Company may make any reduction in any respiratory protection selected pursuant to this New Chemical Exposure Limit section, the Company must verify, by 2 consecutive measurements taken at least 7 days apart, that the new respiratory protection is appropriate in accordance with paragraph (e)(2). Where the PMN substance(s) is manufactured, processed, or used in batches of duration less than 7 days, the 2 consecutive measurements may be taken at least 24 hours apart, provided that the measurements accurately reflect the highest peak exposures and variability in exposure.

(4) Special Situations.

(i) Measurements Outside Quantitation Limits. When a value less than the lower quantitation limit ("LQL") of the analytical method (as described in paragraph (c)(4)(ii)) is measured, the Company shall estimate potential exposure using generally established and accepted statistical methods. If the Company obtains an exposure monitoring sample that is more than 10%

above the actual upper quantitation limit ("UQL") of the analytical method, the Company must ensure that its workers wear at least a NIOSH-certified supplied-air respirator operated in pressure demand or other positive pressure mode and equipped with a tight-fitting full facepiece. Any reductions in this respiratory protection must comply with paragraph (e)(3). The Company may submit an improved analytical method provided that it complies fully with subsection (c) of this New Chemical Exposure Limit section, including the verification required by subsection (c)(3).

(ii) Cleanup and Remedial Actions. During any special cleanup or other remedial actions that may occur before commencing additional exposure monitoring (as discussed in paragraph (d)(5)(ii)), the Company shall ensure that potentially exposed persons use at least the respiratory protection specified above in this subsection (e) for the measured airborne concentration, or more protective respiratory equipment deemed appropriate by the best professional judgment of a qualified expert.

(f) NCEL Recordkeeping.

(1) Whenever the Company elects to comply with this New Chemical Exposure Limit section rather than the respirator requirements in the Protection in the Workplace section of this Order, the Company shall maintain the following records until 30 years after the date they are created, and shall make them available for inspection and copying by EPA in accordance with section 11 of TSCA:

(i) A copy of the sampling and analytical methods used and continuing evidence of their accuracy over time as required by section (c);

(ii) Records documenting compliance with the analytical method verification

requirements of subsection (c)(3), including copies of the signed certification statement and the verification results obtained by both laboratories;

(iii) Records documenting either compliance with the Good Laboratory Practice Standards at 40 CFR Part 792, or use of a laboratory accredited by the American Industrial Hygiene Association ("AIHA") or another comparable program approved in advance in writing by EPA. Where the Company elects to not comply with TSCA GLPS, such records shall include the written accreditation from the AIHA or the written approval from EPA.

(iv) Records documenting all exposure monitoring dates, duration, and results of each sample taken;

(v) Records documenting the name, address, work shift, job classification, and work area of the person monitored and of all other persons whose exposures the monitoring is intended to represent;

(vi) Any conditions that might have affected the monitoring results;

(vii) Notification of exposure monitoring results required by paragraph (d)(6);

(viii) Records documenting any changes in the production, process, control equipment, personnel or work practices that may reasonably cause new or additional exposures to the PMN substance;

(ix) Records documenting any spills, leaks, ruptures or other breakdowns that may cause new or additional exposure;

(x) The type of respiratory protective devices worn by the monitored person, if any;

(xi) Records documenting any actions taken to mitigate exposures to the PMN

substance;

(xii) Records documenting reliance on the objective data exemption in paragraph (d)(7), including: (A) the source of the data, (B) protocols and results of any relevant testing or analysis, (C) a description of the operation exempted and how the data demonstrate that employee exposures will not exceed the action level, (D) other data relevant to the operations, materials and employee exposures covered by the exemption.

HAZARD COMMUNICATION PROGRAM

(a) Written Hazard Communication Program. The Company shall develop and implement a written hazard communication program for each of the PMN substance(s) in each workplace. The written program will, at a minimum, describe how the requirements of this section for labels, MSDSs, and other forms of warning material will be satisfied. The Company must make the written hazard communication program available, upon request, to all employees, contractor employees, and their designated representatives. The Company may rely on an existing hazard communication program, including an existing program established under the OSHA Hazard Communication Standard (29 CFR 1910.1200), to comply with this paragraph provided that the existing hazard communication program satisfies the requirements of this section. The written program shall include the following:

(1) A list of chemical substances known to be present in the work area which are subject to a TSCA section 5(e) consent order signed by the Company or to a TSCA section 5(a)(2) SNUR at 40 C.F.R. Part 721, subpart E. The list must be maintained in each work area where the PMN substance(s) is known to be present and must use the identity provided on the MSDS for the

substance(s) required under paragraph (c) of this section. The list may be compiled for the workplace or for individual work areas. If the Company is required either by another Order issued under section 5(e) of TSCA, or by a TSCA section 5(a)(2) SNUR at 40 CFR Part 721, subpart E, to maintain a list of substances, the lists shall be combined with the list under this subparagraph.

(2) The methods the Company will use to inform employees of the hazards of non-routine tasks involving the PMN substance(s) (e.g., cleaning of reactor vessels), and the hazards associated with the PMN substance(s) contained in unlabeled pipes in their work area.

(3) The methods the Company will use to inform contractors of the presence of the PMN substance(s) in the Company's workplace and of the provisions of this Order if employees of the contractor work in the Company's workplace and are reasonably likely to be exposed to the PMN substance(s) while in the Company's workplace.

(b) Labeling.

(1) The Company shall ensure that each container of the substance(s) in the workplace is labeled in accordance with this subparagraph (b)(1).

(i) The label shall, at a minimum, contain the following information:

(I) A statement of the health hazards(s) and precautionary measure(s), if any, identified in paragraph (f) of this section or by the Company, for the PMN substance.

(II) The identity by which the PMN substance(s) may be commonly recognized.

(III) A statement of exposure and precautionary measure(s), if any, identified in paragraph (f) of this section, or by the Company, for the PMN substance.

(ii) The Company may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys information specified by subparagraph (b)(1)(i) of this section. Any written materials must be readily accessible to the employees in their work areas throughout each work shift.

(iii) The Company need not label portable containers into which the PMN substance(s) is transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer.

(iv) The Company shall not remove or deface an existing label on containers of the PMN substance(s) obtained from persons outside the Company unless the container is immediately re-labeled with the information specified in subparagraph (b)(1)(i) of this section.

(2) The Company shall ensure that each container of the substance(s) leaving its workplace for distribution in commerce is labeled in accordance with this subparagraph (b)(2).

(i) The label shall, at a minimum, contain the following information:

(I) The information prescribed in subparagraph (b)(1)(i) of this section.

(II) The name and address of the manufacturer or a responsible party who can provide additional information on the substance(s) for hazard evaluation and any appropriate emergency procedures.

(ii) The label shall not conflict with the requirements of the Hazardous Materials Transportation Act (18 U.S.C. 1801 et. seq.) and regulations issued under that Act by the Department of Transportation.

(3) The label, or alternative forms of warning, shall be legible and prominently displayed.

(4) The label, or alternative forms of warning, shall be printed in English; however, the information may be repeated in other languages.

(5) If the label or alternative form of warning is to be applied to a mixture containing the PMN substance(s) in combination with any other substance(s) that is either subject to another TSCA section 5(e) Order applicable to the Company, or subject to a TSCA section 5(a)(2) SNUR at 40 CFR Part 721, subpart E, or defined as a "hazardous chemical" under the OSHA Hazard Communication Standard (29 CFR 1900.1200), the Company may prescribe on the label, MSDS, or alternative form of warning, the measures to control worker exposure or environmental release which the Company determines provide the greatest degree of protection. However, should these control measures differ from the applicable measures required under this Order, the Company must seek a determination of equivalency for such alternative control measures pursuant to 40 CFR 721.30 before prescribing them under this subparagraph (b)(5).

(6) If the Company becomes aware of any significant new information regarding the hazards of the PMN substance(s) or ways to protect against the hazards, this new information must be added to the label within 3 months from the time the Company becomes aware of the new information. If the PMN substance(s) is not being manufactured, imported, processed, or used in the Company's workplace, the Company must add the new information to the label before the PMN substance(s) is reintroduced into the workplace.

(c) Material Safety Data Sheets.

(1) The Company must obtain or develop MSDS(s) for the PMN substance(s).

(2) The MSDSs shall contain, at a minimum, the following information:

(i) The identity used on the container label of the PMN substance(s) under this section, and, if not claimed confidential, the chemical and common name of the PMN substance. If the chemical and common name is claimed confidential, a generic chemical name must be used.

(ii) Physical and chemical characteristics of the substance(s) known to the Company, (e.g., vapor pressure, flash point).

(iii) The physical hazards of the substance(s) known to the Company, including the potential for fire, explosion, and reactivity.

(iv) The potential human and environmental hazards as specified in paragraph (f) of this section.

(v) Signs and symptoms of exposure, and any medical conditions which are expected to be aggravated by exposure to the PMN substance(s) known to the Company.

(vi) The primary routes of exposure to the PMN substance.

(vii) Precautionary measures to control worker exposure and/or environmental release required by this Order, or alternative control measures which EPA has determined under 40 CFR 721.30 provide substantially the same degree of protection as the identified control measures. The MSDS must identify any New Chemical Exposure Limits specified in paragraph (b) of the New Chemical Exposure Limit section of this Order and must contain the information specified in the graduated respirator table in paragraph (e)(2) of the New Chemical Exposure Limit section.

(viii) Any generally applicable precautions for safe handling and use of the PMN substance(s) which are known to the Company, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for

response to spills and leaks.

(ix) Any generally applicable control measures which are known to the Company, such as appropriate engineering controls, work practices, or personal protective equipment.

(x) Emergency first aid procedures known to the Company.

(xi) The date of preparation of the MSDS or of its last revision.

(xii) The name, address, and telephone number of the Company or another responsible party who can provide additional information on the chemical substance(s) and any appropriate emergency procedures.

(3) If no relevant information is found or known for any given category on the MSDS, the Company must mark the MSDS to indicate that no applicable information was found.

(4) Where multiple mixtures containing the PMN substance(s) have similar compositions (i.e., the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture) and similar hazards, the Company may prepare one MSDS to apply to all of these multiple mixtures.

(5) If the Company becomes aware of any significant new information regarding the hazards of the PMN substance(s) or ways to protect against the hazards, this new information must be added to the MSDS within 3 months from the time the Company becomes aware of the new information. If the PMN substance(s) is not being manufactured, imported, processed, or used in the Company's workplace, the Company must add the new information to the MSDS before the PMN substance(s) is reintroduced into the workplace.

(6) The Company must ensure that persons receiving the PMN substance(s) from the Company are provided an appropriate MSDS with their initial shipment and with the first shipment

after an MSDS is revised. The Company may either provide the MSDS with the shipped containers or send it to the person prior to or at the time of shipment.

(7) The Company must maintain a copy of the MSDS in its workplace, and must ensure that it is readily accessible during each work shift to employees when they are in their work areas.

(8) The MSDS may be kept in any form, including as operating procedures, and may be designed to cover groups of substances in a work area where it may be more appropriate to address the potential hazards of a process rather than individual substances. However, in all cases, the required information must be provided for the PMN substance(s) and must be readily accessible during each work shift to employees when they are in their work areas.

(9) The MSDS must be printed in English; however, the information may be repeated in other languages.

(d) Employee Information and Training. The Company must ensure that employees are provided with information and training on the PMN substance. This information and training must be provided at the time of each employee's initial assignment to a work area containing the PMN substance(s) and whenever the PMN substance(s) is introduced into the employee's work area for the first time.

(1) The information provided to employees under this paragraph shall include:

(i) The requirements of this section.

(ii) Any operations in the work area where the PMN substance(s) is present.

(iii) The location and availability of the written hazard communication program required under paragraph (a) of this section, including the list of substances required by

subparagraph (a)(1) of this section and MSDSs required by paragraph (c) of this section.

(2) The training provided to employees shall include:

(i) Methods and observations that may be used to detect the presence or release of the PMN substance(s) in or from an employee's work area (such as exposure monitoring conducted by the Company, continuous monitoring devices, visual appearance, or odor of the substance(s) when being released).

(ii) The potential human health and environmental hazards of the PMN substance(s) as specified in paragraph (f) of this section.

(iii) The measures employees can take to protect themselves and the environment from the PMN substance, including specific procedures the Company has implemented to protect employees and the environment from exposure to the PMN substance, including appropriate work practices, emergency procedures, personal protective equipment, engineering controls, and other measures to control worker exposure and/or environmental release required under this Order, or alternative control measures which EPA has determined under 40 CFR 721.30 provide the same degree of protection as the specified control measures.

(iv) The requirements of the hazard communication program developed by the Company under this section, including an explanation of the labeling system and the MSDS required by this section and guidance on obtaining and using appropriate hazard information.

(e) Existing Hazard Communication Program. The Company need not take additional actions if existing programs and procedures satisfy the requirements of this section.

(f) Human Health, Environmental Hazard, Exposure, and Precautionary Statements. The following human health and environmental hazard and precautionary statements shall appear on each label as specified in paragraph (b) and the MSDS as specified in paragraph (c) of this section:

(1) Human health hazard statements. This substance(s) may cause:

(i) birth defects.

(ii) reproductive effects.

(iii) developmental effects.

(iv) internal organ effects (cardiac sensitization)

(2) Human hazard precautionary statements. When using this substance:

(i) avoid breathing the substance.

(ii) use respiratory protection, or maintain workplace airborne concentrations at or below an 8-hour time-weighted average of 3 ppm and a 15-minute time-weighted average at or below 6 ppm.

(5) The human and environmental hazard and precautionary statement on the label prepared pursuant to paragraph (b) of this section must be followed by the statement: "See the MSDS for details."

MANUFACTURING

(a)(1) Prohibition. Except for [redacted] the Company shall not cause, encourage, or suggest the manufacture or import of the PMN substance(s) by any other person.

(2) Sunset Following SNUR. Subparagraph (a)(1) shall expire 75 days after promulgation

of a final significant new use rule ("SNUR") governing the PMN substance(s) under section 5(a)(2) of TSCA unless the Company is notified on or before that day of an action in a Federal Court seeking judicial review of the SNUR. If the Company is so notified, subparagraph (a)(1) shall not expire until EPA notifies the Company in writing that all Federal Court actions involving the SNUR have been resolved and the validity of the SNUR affirmed.

(3) Notice of SNUR. When EPA promulgates a final SNUR for the PMN substance(s) and subparagraph (a)(1) expires in accordance with subparagraph (a)(2), the Company shall notify each person whom it causes, encourages or suggests to manufacture or import the PMN substance(s) of the existence of the SNUR.

(b) The Company shall not manufacture the PMN substance(s) :

(1) P-10-0455:

(i) Beyond an aggregate manufacture and importation volume of 225,000 kg; and

(ii) For use other than as a chemical intermediate.

(2) P-10-0489:

(i) Beyond an aggregate manufacture and importation volume of 175,000 kg; and

(ii) For use other than as a chemical intermediate.

(3) P-10-0457:

(i) Beyond an aggregate manufacture and importation volume of 175,000 kg; and

(ii) For use other than as a chemical intermediate.

PROCESSING

(a) The Company shall not process the PMN substance(s) :

(1) P-10-0455:

(i) For use other than as a chemical intermediate.

(2) P-10-0489:

(i) For use other than as a chemical intermediate.

(3) P-10-0457:

(i) For use other than as a chemical intermediate.

USE

(a) The Company shall not use the PMN substance:

(1) P-10-0455:

(i) Other than as a chemical intermediate.

(2) P-10-0489:

(i) Other than as a chemical intermediate.

(3) P-10-0457:

(i) Other than as a chemical intermediate.

DISTRIBUTION

(a) Export Notice Requirement. No later than the date of distribution, the Company shall notify in writing any person to whom it distributes the PMN substance(s) that, due to the issuance of this Consent Order under section 5(e) of TSCA, the PMN substance(s) are subject to the export

notification requirements of TSCA section 12(b) and 40 CFR Part 707 Subpart D. Such notice shall contain, in the form in which it appears in this Consent Order, the following information: (1) the PMN number(s), and (2) either (A) the specific chemical identities of the PMN substance(s) , or (B) if the specific chemical identities are confidential, the generic chemical identities.

(b) Distribution Requirements. (i) Except as provided in paragraph (c), the Company shall distribute the PMN substances outside the Company, other than for export or disposal, only to a person who has agreed in writing prior to the date of distribution, to:

(1) Notify in writing any person to whom it distributes the PMN substance(s) that, due to the issuance of this Consent Order under section 5(e) of TSCA, the PMN substances are subject to the export notification requirements of TSCA section 12(b) and 40 CFR Part 707 Subpart D. Such notice shall contain, in the form in which it appears in this Consent Order, the following information: (1) the PMN numbers, and (2) either (A) the specific chemical identity of the PMN substance, or (B) if the specific chemical identities are confidential, the generic chemical identities.

(2) Not further distribute the PMN substance(s) to any other person, other than for export or disposal.

(3) Comply with the same requirements and restrictions, if any, required of the Company in the Protection in the Workplace and the New Chemical Exposure Limit sections of this Order.

(4) Comply with the same requirements and restrictions, if any, required of the Company in the Hazard Communication Program section of this Order.

(5) Not process the PMN substance(s) for use other than as chemical intermediates:

(6) Not use the PMN substances other than as chemical intermediates.

(ii) Disposal and Export Exemption. Except for the §12(b) export notice requirement in paragraph (b)(i)(1) above, the distribution requirements in (b)(i) do not apply when the Company distributes the PMN substance(s) for disposal or export only.

(c) Temporary Transport and Storage. Notwithstanding paragraph (b), the Company may distribute the PMN substance(s) outside the Company for temporary transport and storage in sealed containers (labeled in accordance with paragraph (b)(2) of the Hazard Communication Program section of this Order) provided the following two conditions are met:

(1) Subsequent to any such exempt temporary transport or storage of sealed containers, the PMN substance(s) may be distributed only to the Company or a person who has given the Company the written agreement required by paragraph (b).

(2) Any human exposure or environmental release resulting from opening the sealed containers and removing or washing out the PMN substance(s) may occur only while the PMN substance(s) is in the possession and control of the Company or a person who has given the Company the written agreement required by paragraph (b).

(d) Recipient Non-Compliance. If, at any time after commencing distribution in commerce of the PMN substance, the Company obtains knowledge that a recipient of the substance(s) has failed to comply with any of the conditions specified in paragraph (b) of this Distribution section or, after paragraph (b)(2) expires in accordance with subparagraph (e)(1), has engaged in a significant new use of the PMN substance(s) (as defined in 40 CFR Part 721, Subpart E) without submitting a

significant new use notice to EPA, the Company shall cease supplying the substance(s) to that recipient, unless the Company is able to document each of the following:

(1) That the Company has, within 5 working days, notified the recipient in writing that the recipient has failed to comply with any of the conditions specified in paragraph (b) of this Distribution section, or has engaged in a significant new uses of the PMN substance(s) without submitting significant new use notices to EPA.

(2) That, within 15 working days of notifying the recipient of the noncompliance, the Company received from the recipient, in writing, a statement of assurance that the recipient is aware of the terms of paragraph (b) of this Distribution section and will comply with those terms, or is aware of the terms of the significant new use rules for the PMN substance(s) and will not engage in a significant new uses without submitting significant new use notices to EPA.

(3) If, after receiving a statement of assurance from a recipient under subparagraph (d)(2) of this Distribution section, the Company obtains knowledge that the recipient has failed to comply with any of the conditions specified in paragraph (b) of this Distribution section, or has engaged in a significant new uses of the PMN substance(s) without submitting a significant new use notices to EPA, the Company shall cease supplying the PMN substance(s) to that recipient, shall notify EPA of the failure to comply, and shall resume supplying the PMN substance(s) to that recipient only upon written notification from the Agency.

(e) Sunset Following SNUR. (1) Paragraph (b)(2) of this Distribution section shall expire 75 days after promulgation of a final SNUR for the PMN substance(s) under section 5(a)(2) of TSCA, unless the Company is notified on or before that day of an action in a Federal Court seeking

judicial review of the SNUR. If the Company is so notified, paragraph (b)(2) of this Distribution section shall not expire until EPA notifies the Company in writing that all Federal Court actions involving the SNUR have been resolved and the validity of the SNUR affirmed.

(2) When EPA promulgates a final SNUR for the PMN substance(s) and paragraph (b)(2) of this Distribution section expires in accordance with subparagraph (e)(1), the Company shall notify each person to whom it distributes the PMN substance(s) of the existence of the SNURs. Such notification must be in writing and must specifically include all limitations contained in the SNURs which are defined as significant new uses, and which would invoke significant new use notification to EPA for the PMN substances. Such notice must also reference the publication of the SNURs for these PMN substance(s) in either the Federal Register or the Code of Federal Regulations. After promulgation of SNURs and expiration of subparagraph (b)(2), such notice may substitute for the written agreement required in the introductory clause of paragraph (b); so that, if the Company provides such notice to the persons to whom it distributes the PMN substances, then the Company is not required to obtain from such persons the written agreement specified in paragraph (b).

III. RECORDKEEPING

(a) Records. The Company shall maintain the following records until 5 years after the date they are created and shall make them available for inspection and copying by EPA in accordance with section 11 of TSCA:

(1) Exemptions. Records documenting that the PMN substance(s) did in fact qualify for any one or more of the exemptions described in Section I, Paragraph (b) of this Order. Such

records must satisfy all the statutory and regulatory recordkeeping requirements applicable to the exemption being claimed by the Company. Any amounts or batches of the PMN substance(s) eligible for the Export exemption in Section I, Paragraph (b)(2) of this Order are exempt from all the requirements in this Recordkeeping section, if the Company maintains, for 5 years from the date of their creation, copies of the export label and export notice to EPA, required by TSCA sections 12(a)(1)(B) and 12(b), respectively. Any amounts or batches of the PMN substance(s) eligible for the Research and Development exemption in Section I, Paragraph (b)(3) of this Order, are exempt from all the requirements in this Recordkeeping section, if the Company maintains, for 5 years from the date of their creation, the records required by 40 CFR 720.78(b). For any amounts or batches of the PMN substance(s) claimed to be eligible for any other exemption described in Section I, Paragraph (b) of this Order, the Company shall keep records demonstrating qualification for that exemption as well as the records specified in paragraphs (2) and (3) below, but is exempt from the other recordkeeping requirements in this Recordkeeping section;

(2) Records documenting the manufacture and importation volume of the PMN substance(s) and the corresponding dates of manufacture and import;

(3) Records documenting the names and addresses (including shipment destination address, if different) of all persons outside the site of manufacture or import to whom the Company directly sells or transfers the PMN substance, the date of each sale or transfer, and the quantity of the substance(s)sold or transferred on such date;

(4) Records documenting the address of all sites of manufacture, import, processing, and use;

(5) Records documenting establishment and implementation of a program for the use of

any applicable personal protective equipment required pursuant to the Protection in the Workplace section of this Order;

(6) Records required by paragraph (f). of the New Chemical Exposure Limits section of this Order, if applicable;

(7) Records documenting establishment and implementation of the hazard communication program required by the Hazard Communication Program section of this Order;

(8) Copies of labels required under the Hazard Communication Program section of this Order;

(9) Copies of Material Safety Data Sheets required by the Hazard Communication Program section of this Order;

(10) Records documenting compliance with any applicable manufacturing, processing, use, and distribution restrictions in the Manufacturing, Processing, Use, and Distribution sections of this Order, including distributees' written agreement to comply with the Distribution section of this Order;

(11) Records documenting compliance with any applicable disposal requirements under the Disposal section of this Order, including method of disposal, location of disposal sites, dates of disposal, and volume of PMN substance(s) disposed. Where the estimated disposal volume is not known to the Company and is not reasonably ascertainable by the Company, the Company must maintain other records which demonstrate establishment and implementation of a program that ensures compliance with any applicable disposal requirements;

(12) Records documenting establishment and implementation of procedures that ensure compliance with any applicable water discharge limitation in the Release to Water section of this

Order;

(13) Copies of any Transfer Documents and notices required by the Successor Liability section of this Order, if applicable; and

(14) The Company shall keep a copy of this Order at each of its sites where the PMN substance(s) are manufactured or imported.

(b) Applicability. The provisions of this Recordkeeping Section are applicable only to activities of the Company and its Contract Manufacturer, if applicable, and not to activities of the Company's customers.

(c) OMB Control Number. Under the Paperwork Reduction Act and its regulations at 5 CFR Part 1320, particularly 5 CFR 1320.5(b), the Company is not required to respond to this "collection of information" unless this Order displays a currently valid control number from the Office of Management and Budget ("OMB"), and EPA so informs the Company. The "collection of information" required in this TSCA §5(e) Consent Order has been approved under currently valid **OMB Control Number 2070-0012.**

IV. REQUESTS FOR PRE-INSPECTION INFORMATION

(a) EPA's Request for Information. Pursuant to section 11 of TSCA and 40 CFR 720.122, EPA may occasionally conduct on-site compliance inspections of Company facilities and conveyances associated with the PMN substance. To facilitate such inspections, EPA personnel may contact the Company in advance to request information pertinent to the scheduling and conduct of such

inspections. Such requests may be written or oral. The types of information that EPA may request include, but are not limited to, the following:

(i) Expected dates and times when the PMN substance(s) will be in production within the subsequent 12 months;

(ii) Current workshift schedules for workers who are involved in activities associated with the PMN substance(s) and may reasonably be exposed to the PMN substances;

(iii) Current job titles or categories for workers who are involved in activities associated with the PMN substance(s) and may reasonably be exposed to the PMN substances;

(iv) Existing exposure monitoring data for workers who are involved in activities associated with the PMN substance(s) and may reasonably be exposed to the PMN substances;

(v) Records required by the Recordkeeping section of this Order; and/or

(vi) Any other information reasonably related to determining compliance with this Order or conducting an inspection for that purpose.

(b) Company's Response. The Company shall respond to such requests within a reasonable period of time, but in no event later than 30 days after receiving EPA's request. When requested in writing by EPA, the Company's response shall be in writing. To the extent the information is known to or reasonably ascertainable to the Company at the time of the request, the Company's response shall demonstrate a good faith effort to provide reasonably accurate and detailed answers to all of EPA's requests.

(c) Confidential Business Information. Any Confidential Business Information ("CBI") that the Company submits to EPA pursuant to paragraph (b) shall be protected in accordance with §14 of TSCA and 40 CFR Part 2.

V. SUCCESSOR LIABILITY UPON TRANSFER OF CONSENT ORDER

(a) Scope. This section sets forth the procedures by which the Company's rights and obligations under this Order may be transferred when the Company transfers its interests in the PMN substance, including the right to manufacture the PMN substance, to another person outside the Company (the "Successor in Interest").

(b) Relation of Transfer Date to Notice of Commencement ("NOC").

(1) Before NOC. If the transfer from the Company to the Successor in Interest is effective before EPA receives a notice of commencement of manufacture or import ("NOC") for the PMN substance(s) from the Company pursuant to 40 CFR 720.102, the Successor in Interest must submit a new PMN to EPA and comply fully with Section 5(a)(1) of TSCA and 40 CFR part 720 before commencing manufacture or import of the PMN substance.

(2) After NOC. If the transfer from the Company to the Successor in Interest is effective after EPA receives a NOC, the Successor in Interest shall comply with the terms of this Order and shall not be required to submit a new PMN to EPA.

(c) Definitions. The following definitions apply to this Successor Liability section of the Order:

(1) "Successor in Interest" means a person outside the Company who has acquired the

Company's full interest in the rights to manufacture the PMN substance, including all ownership rights and legal liabilities, through a transfer document signed by the Company, as transferor, and the Successor in Interest, as transferee. The term excludes persons who acquire less than the full interest of the Company in the PMN substance, such as a licensee who has acquired a limited license to the patent or manufacturing rights associated with the PMN substance. A Successor in Interest must be incorporated, licensed, or doing business in the United States in accordance with 40 CFR 720.22(a)(3).

(2) "Transfer Document" means the legal instrument(s) used to convey the interests in the PMN substance, including the right to manufacture the PMN substance, from the Company to the Successor in Interest.

(d) Notices.

(1) Notice to Successor in Interest. On or before the effective date of the transfer, the Company shall provide to the Successor in Interest, by registered mail, a copy of the Consent Order and the "Notice of Transfer" document which is incorporated by reference as Attachment C to this Order.

(2) Notice to EPA. Within 10 business days of the effective date of the transfer, the Company shall, by registered mail, submit the fully executed Notice of Transfer document to: U.S. Environmental Protection Agency, New Chemicals Branch (7405), 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460.

(3) Transfer Document. Copies of the Transfer Document must be maintained by the Successor in Interest at its principal place of business, and at all sites where the PMN substance(s)

are manufactured or imported. Copies of the Transfer Document must also be made available for inspection pursuant to Section 11 of TSCA, must state the effective date of transfer, and must contain provisions which expressly transfer liability for the PMN substance(s) under the terms of this Order from the Company to the Successor in Interest.

(e) Liability.

(1) The Company shall be liable for compliance with the requirements of this Order until the effective date of the transfer described above.

(2) The Successor in Interest shall be liable for compliance with the requirements of this Order effective as of the date of transfer.

(3) Nothing in this section shall be construed to prohibit the Agency from taking enforcement action against the Company after the effective date of the transfer for actions taken, or omissions made, during the time in which the Company manufactured, processed, used, distributed in commerce, or disposed of the PMN substance(s) pursuant to the terms of this Consent Order.

(f) Obligations to Submit Test Data under Consent Order. If paragraph (d) of the Testing section of this Consent Order requires the Company to submit test data to EPA at a specified production volume ("test trigger"), the aggregate volume of the PMN substance(s) manufactured and imported by the Company up to the date of transfer shall count towards the test trigger applicable to the Successor in Interest.

VI. MODIFICATION AND REVOCATION OF CONSENT ORDER

The Company may petition EPA at any time, based upon new information on the health effects of, or human exposure to, the PMN substance, to modify or revoke substantive provisions of this Order. The exposures and risks identified by EPA during its review of the PMN substance(s) and the information EPA determined to be necessary to evaluate those exposures and risks are described in the preamble to this Order. However, in determining whether to amend or revoke this Order, EPA will consider all relevant information available at the time the Agency makes that determination, including, where appropriate, any reassessment of the test data or other information that supports the findings in this Order, an examination of new test data or other information or analysis, and any other relevant information.

EPA will issue a modification or revocation if EPA determines that the activities proposed therein will not present an unreasonable risk of injury to health or the environment and will not result in significant or substantial human exposure or substantial environmental release in the absence of data sufficient to permit a reasoned evaluation of the health or environmental effects of the PMN substance.

In addition, the Company may petition EPA at any time to make other modifications to the language of this Order. EPA will issue such a modification if EPA determines that the modification is useful, appropriate, and consistent with the structure and intent of this Order as issued.

VII. EFFECT OF CONSENT ORDER

(a) Waiver. By consenting to the entry of this Order, the Company waives its rights to file objections to this Order pursuant to section 5(e)(1)(C) of TSCA, to receive service of this Order no later than 45 days before the end of the review period pursuant to section 5(e)(1)(B) of TSCA, and to challenge the validity of this Order in any subsequent action. Consenting to the entry of this Order, and agreeing to be bound by its terms, do not constitute an admission by the Company as to the facts or conclusions underlying the Agency's determinations in this proceeding. This waiver does not affect any other rights that the Company may have under TSCA.

(b) CBI Brackets. By signing this Order, the Company represents that it has carefully reviewed this document and hereby agrees that all information herein that is claimed as confidential by the Company (per section 14 of TSCA, 40 CFR Part 720 Subpart E, and 40 CFR Part 2) is correctly identified within brackets and that any information that is not bracketed is not claimed as confidential. To make this document available for public viewing, EPA will remove only the information contained within the brackets.

1/25/11
Date

Jim Willis, Director
Chemical Control Division
Office of Pollution Prevention and Toxics

1/24/11
Date

Name: Terrence Hahn
Title: Vice President General Manager
Company: Honeywell Chemicals

ATTACHMENT A

DEFINITIONS

[Note: The attached Order may not contain some of the terms defined below.]

"Chemical name" means the scientific designation of a chemical substance in accordance with the nomenclature system developed by the Chemical Abstracts Service's rules of nomenclature, or a name which will clearly identify a chemical substance for the purpose of conducting a hazard evaluation.

"Chemical protective clothing" means items of clothing that provide a protective barrier to prevent dermal contact with chemical substances of concern. Examples can include, but are not limited to: full body protective clothing, boots, coveralls, gloves, jackets, and pants.

"Company" means the person or persons subject to this Order.

"Commercial use" means the use of a chemical substance or any mixture containing the chemical substance in a commercial enterprise providing saleable goods or a service to consumers (e.g., a commercial dry cleaning establishment or painting contractor).

"Common name" means any designation or identification such as code name, code number, trade name, brand name, or generic chemical name used to identify a chemical substance other than by its chemical name.

"Consumer" means a private individual who uses a chemical substance or any product containing the chemical substance in or around a permanent or temporary household or residence, during recreation, or for any personal use or enjoyment.

"Consumer product" means a chemical substance that is directly, or as part of a mixture, sold or made available to consumers for their use in or around a permanent or temporary household or residence, in or around a school, or in recreation.

"Container" means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

"Identity" means any chemical or common name used to identify a chemical substance or a mixture containing that substance.

"Immediate use." A chemical substance is for the "immediate use" of a person if it is under the control of, and used only by, the person who transferred it from a labeled container and will only be used by that person within the work shift in which it is transferred from the labeled container.

"MSDS" means material safety data sheet, the written listing of data for the chemical substance.

"NIOSH" means the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services.

"Non-enclosed process" means any equipment system (such as an open-top reactor, storage tank, or mixing vessel) in which a chemical substance is manufactured, processed, or otherwise used where significant direct contact of the bulk chemical substance and the workplace air may occur.

"Non-industrial use" means use other than at a facility where chemical substances or mixtures are manufactured, imported, or processed.

"PMN substance" means the chemical substance described in the Premanufacture notice submitted by the Company relevant to this Order.

"Personal protective equipment" means any chemical protective clothing or device placed on the body to prevent contact with, and exposure to, an identified chemical substance or substances in the work area. Examples include, but are not limited to, chemical protective clothing, aprons, hoods, chemical goggles, face splash shields, or equivalent eye protection, and various types of respirators. Barrier creams are not included in this definition.

"Process stream" means all reasonably anticipated transfer, flow, or disposal of a chemical substance, regardless of physical state or concentration, through all intended operations of processing, including the cleaning of equipment.

"Sealed container" means a closed container that is physically and chemically suitable for long-term containment of the PMN substance, and from which there will be no human exposure to, or environmental release of, the PMN substances during transport and storage.

"Use stream" means all reasonably anticipated transfer, flow, or disposal of a chemical substance, regardless of physical state or concentration, through all intended operations of industrial, commercial, or consumer use.

"Waters of the United States" has the meaning set forth in 40 CFR 122.2.

"Work area" means a room or defined space in a workplace where the PMN substances is manufactured, processed, or used and where employees are present.

"Workplace" means an establishment at one geographic location containing one or more work areas.

ATTACHMENT B

STATISTICAL ANALYSIS OF NCELs ANALYTICAL METHOD VERIFICATION RESULTS

This Attachment describes the statistical technique (with examples) for comparing the analytical results obtained by two laboratories pursuant to paragraph (c)(3)(vii) of the New Chemical Exposure Limit section of this Order.

STATISTICAL TECHNIQUE

To obtain two-sample t test with unequal variances, perform the following operations:

- Compute means of the data measured by two laboratories.
- Compute mean squares

$$S_i^2 = \sum(\bar{X}_{ij} - X_i)^2/(n_i - 1),\ i=1, 2$$

- Form the ratio

$$T = (\bar{X}_1 - \bar{X}_2)/(W_1 + W_2)^{1/2}$$

- Compute degrees of freedom

$$f = (W_1 + W_2)^2/[W_1^2/(n_1 - 1) + W_2^2/(n_2 - 1)]$$

where,

$W_1 = S_1^2/n_1,\ i = 1, 2$

$\bar{X}_1$ = Average of the results from the company laboratory

$\bar{X}_2$ = Average of the results from the independent laboratory

n_1 = Number of samples analyzed by the company laboratory

n_2 = Number of samples analyzed by the independent laboratory.

Then compare the absolute value of T to the 97.5 percentile point of a t distribution with f degrees of freedom. If the absolute value exceeds the 97.5 percentile point, the results measured by two laboratories are significantly different at 95% level. Otherwise, they are not significantly different. In general, f may not be an integer. Use interpolation to obtain the 97.5 percentile point of a t distribution with f degrees of freedom.

EXAMPLES -- The following examples (based on simulated data) illustrate the method:

Example 1

Data Set 1	Data Set 2
80.56	97.11
100.01	102.13
86.04	99.83
52.61	97.83
84.85	105.44
95.75	100.04

$\bar{X}_1 = 83.30$ $n_1 = 6$ $\bar{X}_2 = 100.40$ $n_2 = 6$

$S_1^1 = 278.72$ $W_1 = 46.25$ $S_2^2 = 9.26$ $W_2 = 1.54$

Absolute value of $T = 2.467$ $f = 5.33$

The t table shows that the 97.5 percentile point is 2.571 and 2.447 for 5 and 6 degrees of freedom, respectively. For 5.33 degrees of freedom, the 97.5 percentile point will be approximately 2.530 which is greater than the absolute value of T, 2.467. Hence, the means of two data sets are not significantly different at the 5% level.

However, if this problem had been treated as an ordinary two-sample t test, the means would be significantly different at the 5% level because the absolute of T is greater than 2.228, the 97.5 percentile point for the t distribution with 10 degrees of freedom.

Example 2

Data Set 1	Data Set 2
82.87	108.05
101.85	96.51
87.44	100.04
99.68	104.33
101.15	110.32
99.21	107.00

$\bar{X}_1 = 95.37$ $n_1 = 6$ $\bar{X}_2 = 104.37$ $n_2 = 6$

$S_1^2 = 65.59$ $W_1 = 10.93$ $S_2^2 = 27.25$ $W_2 = 4.54$

Absolute value of T = 2.290 f = 8.54

The t table shows that for 8 and 9 degrees of freedom the 97.5 percentile point is 2.306 and 2.262, respectively. For 8.54 degrees of freedom the 97.5 percentile point will be approximately 2.282 which is less than the absolute value of T, 2.290. Hence, the means of two data sets are significantly different at the 5% level.

ATTACHMENT C

NOTICE OF TRANSFER
OF
TOXIC SUBSTANCES CONTROL ACT
SECTION 5(e) CONSENT ORDER

_____ _____
Company (Transferor) PMN Number

1. Transfer of Manufacture Rights. Effective on _____, the Company did sell or otherwise transfer to _____, ("Successor in Interest") the rights and liabilities associated with manufacture of the above-referenced chemical substance, which was the subject of a premanufacture notice ("PMN") and is governed by a Consent Order issued by the U.S. Environmental Protection Agency ("EPA") under the authority of §5(e) of the Toxic Substances Control Act ("TSCA," 15 U.S.C. §2604(e)).

2. Assumption of Liability. The Successor in Interest hereby certifies that, as of the effective date of transfer, all actions or omissions governed by the applicable Consent Order limiting manufacture, processing, use, distribution in commerce and disposal of the PMN substance, shall be the responsibility of the Successor in Interest. Successor in Interest also certifies that it is incorporated, licensed, or doing business in the United States in accordance with 40 CFR 720.22(a)(3).

3. Confidential Business Information. The Successor in Interest hereby:

___ reasserts,

___ relinquishes, or

___ modifies

all Confidential Business Information ("CBI") claims made by the Company, pursuant to Section 14 of TSCA and 40 CFR part 2, for the PMN substance(s). Where "reasserts" or "relinquishes" is indicated, that designation shall be deemed to apply to all such claims. Where "modifies" is indicated, such modification shall be explained in detail in an attachment to this Notice of Transfer. Information which has been previously disclosed to the public (e.g., a chemical identity that was not claimed as CBI by the original submitter) would not subsequently be eligible for confidential treatment under this Notice of Transfer.

TOXIC SUBSTANCES CONTROL ACT
SECTION 5(c) CONSENT ORDER

NOTICE OF TRANSFER
(continued)

Company (Transferor)	PMN Number
Signature of Authorized Official	Date
Printed Name of Authorized Official	
Title of Authorized Official	
Successor in Interest	
Signature of Authorized Official	Date
Printed Name of Authorized Official	
Title of Authorized Official	
Address	
City, State, Zip Code	

TOXIC SUBSTANCES CONTROL ACT
SECTION 5(e) CONSENT ORDER

NOTICE OF TRANSFER
(continued)

_____
Successor's Technical Contact

_____
Address

_____
City, State, Zip Code

_____
Phone